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1	C-2 WASTE ANALYSIS PLAN [6 CCR 1007-3 § 100.41(a)(3) and § 264.13(b) and (c)]					
2						
3	This section describes how wastes will be characterized at the PCAPP EDS site operations and addresse					
4	(1) analytical parameters and the rationale for their selection; (2) test methods; (3) sampling methods;					
5	(4) frequency of analyses; (5) additional requirements for wastes generated offsite; and (6) additional					
6	requirements for ignitable, reactive, or incompatible wastes.					
7						
8	C-2a Parameters and Rationale [6 CCR 1007-3 § 264.13(b)(1)]					
9						
10	Waste stream analytical parameters and the rationale for selecting these parameters are summarized in					
11	Table C-2-1 . ¹					
12						
13	Note that the items will have been characterized for treatment purposes prior to acceptance at the PCAPP					
14	EDS site for treatment as described in Section C-1g(3) of this permit modification. Therefore, no					
15	additional analysis is required for treatment.					
16						
17	C-2b Test Methods [6 CCR 1007-3 § 264.13(b)(2)]					
18						
19	Table C-2-1 lists the test methods that will be used for characterizing wastes. Both process knowledge					
20	and sampling and analysis will be used as appropriate. Analytical methods used for waste					
21	characterization are from: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,					
22	SW-846, current edition; Annual Book of ASTM Standards, American Society for Testing and Materials					
23	or other USEPA-recognized methods as referenced in the Colorado Hazardous Waste Regulations					
24	(6 CCR 1007-3).					
25						
26	General laboratory quality assurance/quality control (QA/QC) procedures for RCRA waste					
27	characterization will be in accordance with the specified analytical methods for individual parameters (see					
28	Table C-2-1), as described in SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical					
29	Methods, current edition. QA/QC procedures for RCRA waste analysis are detailed in the RCRA Waste					
30	Analysis Quality Assurance/Quality Control Plan included in Attachment C-4.					

-

All tables are located at the end of this section.

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1 Chemical agent analysis will be conducted using U.S. Army analytical methods. QA/QC for chemical

- 2 agent analysis will be in accordance with the U.S. Army Chemical Materials Agency *Programmatic*
- 3 Laboratory and Monitoring Quality Assurance Plan.

4

5 **C-2c Sampling Methods** [6 CCR 1007-3 § 264.13(b)(3)]

6

- 7 **Table C-2-2** lists the type of equipment and sampling methods, where appropriate, that will be used to
- 8 obtain a representative sample of each waste type. Methods used to obtain a representative sample will be
- 9 consistent with the sampling approaches and protocols described in Test Methods for Evaluating Solid
- 10 Waste, Physical/Chemical Methods, SW-846, current edition, as referenced in the Colorado Hazardous
- Waste Regulations (6 CCR 1007-3). For each waste stream sampled, appropriate QA/QC samples will be
- collected as described in **Attachment C-3**. Appropriate sampling techniques and sample containers
- 13 selected are based on knowledge of the waste material matrix (solid, liquid) and analyte or parameter of
- 14 interest.

15 16

C-2d Laboratory QA/QC

17

- An analytical laboratory must conduct its operations in such a way as to provide reliable information.
- 19 The PCAPP EDS site Mobile Analytical Platform will be used for chemical agent analysis. The QA/QC
- 20 of data generated by the onsite chemical agent analysis Mobile Analytical Platform will be controlled by
- 21 the U.S. Army Chemical Materials Agency Programmatic Laboratory and Monitoring Quality Assurance
- 22 *Plan*.

23

- 24 A contract laboratory accredited in the National Environmental Laboratory Accreditation Program
- 25 (NELAP) will be used for RCRA characterization sample analyses and that contract laboratory's quality
- assurance plan will be followed for those analyses. The Joint Project Manager Elimination (Provisional)
- 27 (JPM E (P)) will ensure that the contract laboratory's QA/QC training program includes, at a minimum,
- sample custody procedures, an analyst training program, data review procedures, internal laboratory
- 29 samples, and performance audits. The laboratory must have a data management system that allows them
- 30 to meet analytical holding times and results reporting requirements. The laboratory must also achieve
- 31 method detection limits sufficient to meet the established regulatory limits. The laboratory must also
- 32 have acceptable preparation, analytical, and cleanup methodologies.

2					
3	Neutralent samples are collected and analyzed to ensure treatment levels identified in Table C-1-7 are				
4	met. Chemical agent analysis will be performed on every batch of neutralent generated. A neutralent				
5	batch is defined as the volume of treatment reagent and chemical fill contained in the EDS Containment				
6	Vessel after the chemical fill from an explosively opened munition or other container (for example,				
7	cylinder) has been treated. Every container of solid waste generated from the EDS treatment process wi				
8	be agent screened.				
9					
10	RCRA characterization sampling and analysis will be conducted on the first batch of neutralent and				
11	rinsewater wastes generated from the first shot (detonation) processed per chemical fill/munition				
12	configuration or item type treated. The information will be used to establish a baseline for generator				
13	knowledge and to prepare waste profiles. Table C-2-2 identifies the frequency of sampling and analysis.				
14					
15	C-2f Additional Requirements for Wastes Generated Offsite [6 CCR 1007-3 § 264.13(c)]				
16					
17	All items to be treated in the EDS units will come from PCD permitted hazardous waste storage.				
18	Therefore, this section is not applicable.				
19					
20	C-2g Additional Requirements for Ignitable, Reactive, or Incompatible Wastes [6 CCR 1007-3				
21	§ 264.13(b)(6) and 264.17]				
22					
23	The waste characterization and information described in Sections C-1, Chemical and Physical Analyses,				
24	and C-2, Waste Analysis Plan, provide the information and methods needed to identify ignitable, reactive				
25	and incompatible wastes. The EDS units will treat items that contain energetic material (reactives); thus,				
26	the EDS units have been designed to manage the hazards inherent in handling and managing the reactive				
27	materials. Additionally, the chemical fill and explosive components that will be treated in the EDS units				
28	are compatible with the associated treatment reagents and the process equipment to be used.				
29					
30	The CSU will be used to store items pending treatment in the EDS units. As all wastes to be treated				
31	contain mustard agent HD/HT and are munition or munition derived, incompatibility will not be an issue				
32	The Army will contain, store, and manage all hazardous waste to prevent chemical reactions.				

C-2e Frequency of Analyses [6 CCR 1007-3 § 264.13(b)(4)]

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1 C-2h Additional Requirements Pertaining to Incinerator, Boiler, and Industrial Furnace Facilities [6 CCR 1007-3 § 264.340] 2 3 4 The hazardous waste management units addressed in this permit modification are not incinerators, boilers, 5 or industrial furnaces that burn hazardous wastes; therefore, this section is not applicable. 6 7 C-2i Additional Requirements Pertaining to Containment Buildings [6 CCR 1007-3 § 264.1100] 8 9 The hazardous waste management units addressed in this permit modification are not containment buildings; therefore, this section is not applicable. 10

Table C-2-1. Selected Parameters, Test Methods, and Rationale for EDS Process Wastes

Waste Stream	Parameter/Analysis	Test Methods a,b,c	Analysis Rationale
Mustard (HD/HT) Agent Neutralent	HD/HT ^d	U.S. Army-approved methods	Verify treatment level is met.
	TC Metals	Process knowledge or 3010A or 3020A or 6010C or 6020A; 7470A	Ensure safe handling, storage, and treatment; compliance with applicable regulations; ensure that all physical and chemical characteristics are
	TC SVOCs	Process knowledge or 3510C or 3520C or 8270D	known prior to disposition; determine further waste management needs.
	TC VOCs	Process knowledge or 5030B/8260B	Process knowledge will be used for RCRA waste characterization where appropriate.
	рН	Process knowledge or 9041A or 9040C	
	Ignitability	Process knowledge or 1010A or 1020B	
Rinsewater	TC Metals	Process knowledge or 3010A or 3020A/6010C or 6020A; 7470A	Verify treatment level is met.
	TC SVOCs	Process knowledge or 3510C or 3520C/8270D	Ensure safe handling, storage, and treatment; compliance with applicable regulations; ensure that all physical and chemical characteristics are known prior to disposition; determine further
	TC VOCs	Process knowledge or 5030B/8260B	waste management needs.
	рН	Process knowledge or 9041A or 9040C	Process knowledge will be used for RCRA waste characterization where appropriate.
	Ignitability	Process knowledge or 1010A or 1020B	

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Table C-2-1. Selected Parameters, Test Methods, and Rationale for EDS Process Wastes (Continued)

Waste Stream	Parameter/Analysis	Test Methods ^{a,b,c}	Analysis Rationale
Used Decontamination Solution ^g	HD/HT ^d (as applicable)	U.S. Army-approved methods	Verify treatment level is met.
	TC Metals	Process knowledge or 3010A or 3020A/6010C or 6020A; 7470A	Ensure safe handling, storage, and treatment; compliance with applicable regulations; ensure that all physical and chemical characteristics are known
	TC SVOCs	Process knowledge or 3510C or 3520C/8270D	prior to disposition; determine further waste management needs.
	TC VOCs	Process knowledge or 5030B/8260B	Process knowledge will be used for RCRA waste characterization where appropriate.
	рН	Process knowledge or 9040A/9045	
	Ignitability	Process knowledge or 1010A or 1020B	
Spent Carbon, Prefilters, and HEPA Filters (from the Environmental	HD/HT ^d	U.S. Army-approved headspace monitoring methods	Ensure safe handling, storage, treatment; compliance with applicable regulations; determine
Enclosure Air Filtration System [AFS] and CSU)	TC Metals ^e	Process knowledge	further waste management needs.
	TC Organics f	Process knowledge	
Miscellaneous Liquids (Including Chemical or Supply Spill or Other	HD/HT ^d	U.S. Army-approved methods	Verify treatment level is met.
Fluids Including Waste Oil and Solvents)	Total Metals	Process knowledge or 7470A, and 7471B, 6010C, 3010A	Ensure safe handling, storage, and treatment; compliance with applicable regulations; ensure that
	Total Organics	Process knowledge or 8260B, 8270D	all physical and chemical characteristics are known prior to disposition; determine further waste management needs.
	pН	Process knowledge or 9040A/905	Process knowledge will be used for RCRA waste
	Ignitability	Process knowledge or 1010	characterization where appropriate.

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Table C-2-1. Selected Parameters, Test Methods, and Rationale for EDS Process Wastes (Continued)

Waste Stream	Parameter/Analysis	Test Methods ^{a,b,c}	Analysis Rationale
Liquid Laboratory Waste	HD/HT ^d	U.S. Army-approved methods	Verify treatment level is met.
	Total Metals	Process knowledge or 7470A, and 7471B, 6010C, 3010A	Ensure safe handling, storage, and treatment; compliance with applicable regulations; ensure that all physical and chemical characteristics are known
	Total Organics	Process knowledge or 8260B, 8270D	prior to disposition; determine further waste management needs.
	рН	Process knowledge or 9040A/905	Process knowledge will be used for RCRA waste characterization where appropriate.
	Ignitability	Process knowledge or 1010	Characterization where appropriate
Solid Laboratory Waste (Including Labware, Sampling Equipment, Plastic Bags, Stainless Steel Sample Bottle	HD/HT ^d	U.S. Army-approved headspace monitoring methods	Ensure safe handling, storage, and treatment; compliance with applicable regulations; determine further waste management needs and container
Assemblies, and Packing Material)	TC Metals	Process knowledge	management practices.
	TC Organics	Process knowledge	Process knowledge will be used for RCRA waste characterization where appropriate
Miscellaneous Solids (Including Spill Cleanup, Debris, Decontaminated Metal Parts, Fragments, Plastic Shards,	HD/HT ^d	U.S. Army-approved headspace monitoring methods	Ensure safe handling, storage, and treatment; compliance with applicable regulations; ensure that all physical and chemical characteristics are known
Grayloc [®] seals and O-rings ^a)	TC Metals ^e	Process knowledge	prior to disposition; determine further waste
	TC Organics ^f	Process knowledge	management needs.
Potentially Contaminated PPE	HD/HT ^d	U.S. Army-approved headspace monitoring methods	Ensure safe handling, storage, and treatment; compliance with applicable regulations; determine further waste management needs and container
	TC Organics ^f	Process knowledge ^c	management practices.

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Table C-2-1. Selected Parameters, Test Methods, and Rationale for EDS Process Wastes (Continued)

Waste Stream	Parameter/Analysis	Test Methods ^{a,b,c}	Analysis Rationale
Unexploded Energetic Compounds (if generated)	HD/HT ^d	U.S. Army-approved headspace monitoring methods	Ensure safe handling, storage, and treatment; compliance with applicable regulations; determine further waste management needs and container management practices.

Notes:

2 3 4

5

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- Methods are from *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, current edition, as referenced in the Colorado Hazardous Waste Regulations (6 CCR 1007-3) unless otherwise specified. The analytical methods listed may have been updated since this permit modification was developed. The most current methods will be used during EDS operations.
- 7 b U.S. Army Test Methods will be used for mustard agent analysis.
- Process knowledge will be used for RCRA waste characterization after an initial waste profile has been established per waste stream. The Army will perform additional analysis if process knowledge is determined to be insufficient or if abnormalities in process occur.
- 10 d HD/HT will be analyzed as H.
- TC metals consist of arsenic (D004), barium (D005), cadmium (D006), chromium (D007), lead (D008), mercury (D009), selenium (D010), and silver (D011).
- TC organics of interest consist of chloroform (D022), 1,2-dichloroethane (D028), 1,1 dichloroethylene (D029), 2,4 dinitrotoluene (D030), hexachloroethane (D034), tetrachloroethane (D039), trichloroethene (D040), and vinyl chloride (D043).
- 15 g If decontamination solutions were used for decontaminating chemical agent, then analyze for potential agent contaminants listed.

16

- 17 CSU = Container Storage Unit
- 18 EDS = Explosive Destruction System
- 19 HD = distilled sulfur mustard
- 20 HEPA = high efficiency particulate air
- 21 HT = mustard-T mixture
- 22 PPE = personal protective equipment
- 23 RCRA = Resource Conservation and Recovery Act
- 24 SVOC = semivolatile organic compound
- 25 TC = toxicity characteristic
- 26 VOC = volatile organic compound

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Table C-2-2. Sampling Equipment Methods and Frequency

Media and Waste Stream	Sample Type	Method and Equipment ^a	Frequency
Vapor			
Headspace Monitoring for HD/HT	Grab	Prior to draining the neutralent from the Containment Vessel, collect a headspace vapor sample per EDS SOP and analyze before opening door. This sample is then transferred to a DAAMS tube for analysis in the MAP.	Each chemical agent treatment operation.
Headspace Monitoring of Solids: Metal Parts, Fragments, UMSC Debris, Dunnage Spent Filters (pre-, HEPA, and carbon) Laboratory Waste Personal Protective Equipment Grayloc® Seals and O-rings Unexploded Energetic Components (if generated) Miscellaneous Solid Waste (hoses, valves, absorbent rags, wipes, etc.)	Grab	Waste material will be bagged inside a waste container and the bagged contents will be monitored using MINICAMS or DAAMS tubes.	Every container of solid waste generated from an EDS chemical agent treatment process.
<u>Liquid</u>			
Neutralent (for Agent Analysis, Process Monitoring, and RCRA Waste Characterization)	Grab	For chemical agent samples, collect liquid sample from EDS Containment Vessel sample valve assembly per EDS SOP. For RCRA waste characterization sampling, collect sample from waste container using a COLIWASA or drum thief per EDS SOP or ASTM D5495-03.	For chemical agent analysis, each batch of neutralent generated. For RCRA waste characterization, perform sampling and analysis on the first batch of neutralent wastes generated from the first shot (detonation) processed per chemical fill and munition type/configuration or item.
Rinsewater	Grab	For RCRA waste characterization sampling, collect sample from waste container using a COLIWASA, or drum thief per EDS SOP or ASTM D5495-03.	For RCRA waste characterization, perform sampling and analysis on the first batch of rinsewater wastes generated from the first shot (detonation) processed per chemical fill and munition type or item.

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Table C-2-2. Sampling Equipment Methods and Frequency (Continued)

Media and Waste Stream	Sample Type	Method and Equipment ^a	Frequency
Used Decontamination Solutions	Grab	Collect liquid samples from waste container using a COLIWASA per EDS SOP or ASTM D5495-03.	Each container generated.

Notes:

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5

As applicable, equipment used to sample waste materials will be disposable or designed for easy decontamination. Contaminated disposable equipment will be managed as hazardous waste, as appropriate. Cleanable equipment will be thoroughly decontaminated prior to reuse. Used decontamination solutions will be managed as hazardous waste.

ASTM = American Society for Testing and Materials

9 COLIWASA = composite liquid waste sampler 10 DAAMS = Depot Area Air Monitoring System

11 EDS = Explosive Destruction System

12 HD = distilled sulfur mustard

13 HEPA = high efficiency particulate air

14 HT = mustard-T mixture

15 MAP = Mobile Analytical Platform

16 RCRA = Resource Conservation and Recovery Act

17 SOP = Standing Operating Procedure

18 UMSC = universal munition storage container

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